

Become a Math Author!

A Project for Geometry Students

Name _____ Hour _____



Write a Children's Geometry Story Book!

Due Date _____

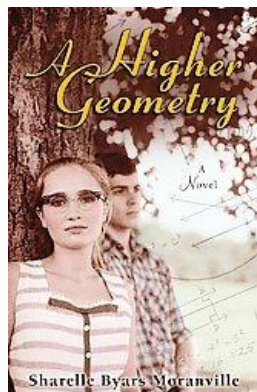
Prepare to write your story :

1. Choose a math topic and math standard(s) from the list of standards to focus your book on.
2. Pick the vocabulary words (10 or more geometry words) that you'll use to support the math topic that you've chosen. Feel free to use other math vocabulary to support your story.
3. Choose an age or grade level for children that your book will be appropriate for.
4. Create a name for your main character(s).
5. Choose a setting for your story.
6. Create a plot for the story.
7. Choose a Title for your book...(Some books that have been published include *The Greedy Triangle*; *How Big is a Foot*; *Sir Cumference and the Dragon of Pi*; *Sir Cumference and the Great Knight of Angleland*; *A Higher Geometry*; *So Many Circles, So Many Squares*; *Shapes, Shapes, Shapes*, *A fly on the Ceiling*, etc.)

Write your story:

1. Write a rough draft of your story.
2. Read it to at least two people (at least one adult) and ask them to tell you what they like about the story, whether you've used the geometry vocabulary correctly, and what they would change to make it better. Document this on your evaluation sheet. Your reviewers must sign your sheet!
3. Make revisions and word-process the text.
4. Divide the book into a *minimum of 10 "children book" pages* so that you can add illustrations to your story.

5. *Bibliography and Illustrations:* Illustrations can be original (which are preferred) - drawings or photographs that you've taken OR un-copyrighted clipart. If you use clipart, make sure to include a page that cites where the pictures came from – Include a copy of the picture and a link to the *exact* page on the Internet with the picture on it.



Evaluation of the
Children's Book about Geometry....

Name _____ hr _____

Date _____

	Complete this information if asked for	Points Possible	Points Awarded
Geometry topic (fill in the box →)		3	
Geometry Standard (fill in the box →) Write 7A, 7B, 7C, 9A, 9B, 9C, or 9D		4	
Age or grade level of targeted audience (fill in the box →)		1	
Geometry Vocabulary used		10	
I read my book to these two people and their critiques are attached to this evaluation.		6	
Story	Creative, interesting, accurate, appropriate for children	50	
Correct use of geometry vocabulary	Introduced, reinforced, and encouraged the correct use of vocabulary	10	
Illustrations	Appropriate illustrations – enhanced the story and accuracy of important geometric drawings	10	
Resources cited - <u>minimum of two</u> sources – <i>none from Wikipedia</i>	Include <ul style="list-style-type: none"> • links to specific Internet pages and • complete citations for other sources including <ul style="list-style-type: none"> ○ Name of book or magazine, ○ author, publisher and ○ copyright date, and ○ page numbers. • Include sources for all pictures that are not original drawings or photographs that you have taken. 	6	
	Total Points	100	

Storybook Feedback Form

At least ***two*** people must read your book before you put the finishing touches on it and give you feedback. Your feedback must come from ***at least one adult***. Have each person fill out the evaluation form below and sign their evaluation. Submit this document with your evaluation and book when it is ready to grade.

Feedback Form #1

I read the book written by _____ and here are my comments and suggestions:

Signature _____

Relationship to the author: *circle one*

Parent Grandparent Brother Sister Friend Other : _____

Age Greater than 18 Less than 18

Feedback Form #2

I read the book written by _____ and here are my comments and suggestions:

Signature _____

Relationship to the author: *circle one*

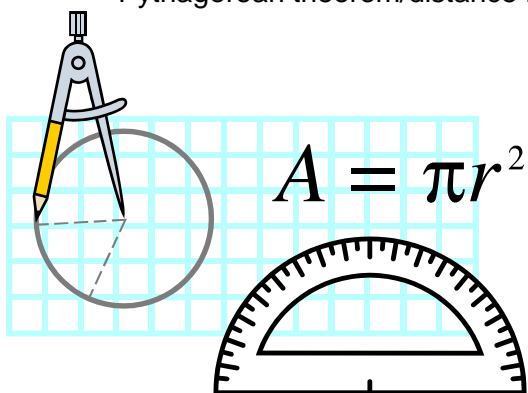
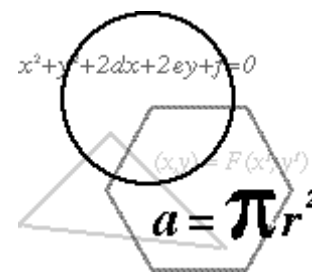
Parent Grandparent Brother Sister Friend Other : _____

Age Greater than 18 Less than 18

Topics and Standards

Topics include but are not limited to one or more of the following::

- Angles
- Altitude to hypotenuse theorems and geometric means
- Circles – parts, arcs, angles, segments, circumference, area
- Congruent Triangles/Figures
- Constructions
- Coordinate Geometry
- Equidistance
- Lines and planes in space
- Logic and Deductive Structure
- Medians, altitudes, angle bisectors, perpendicular bisectors, midlines
- Parallel lines
- Perimeter and Area
- Perpendicularity
- Polygons - Triangles, Quadrilaterals, and others
- Probability
- Proofs – Direct, indirect, conjectures, justifications, 2-column, paragraph
- Pythagorean theorem/distance formula
- Pythagorean Triples and special right triangles (30°-60°-90° and 45°-45°-90° triangles)
- Ratios and Proportions with geometric figures
- Segments
- Slope
- Similar polygons
- Solid Geometry on prisms, pyramids, cylinders, cones, spheres and hemispheres including surface area and volume
- Transformational Geometry – reflections, rotations, translations, and dilations
- Trigonometry



State Goals and Standards:

STATE GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Why This Goal Is Important: Measurement provides a way to answer questions about “how many,” “how much” and “how far.” It is an indispensable component of business, manufacturing, art, medicine and many other aspects of daily life. We describe the sizes, capacities and values of many things, from the large distances involved in space travel,

to the very small quantities in computer design and microbiology, to the varying values of currencies in international monetary exchange. All people must be able to choose an appropriate level of accuracy for a measurement; to select what measuring instruments to use and to correctly determine the measures of objects, space and time. These activities require people to be able to use standard instruments including rulers, volume and capacity measures, timers and emerging measurement technologies found in the home and workplace.

► **Standard 7A** - Students who meet the standard can measure and compare quantities using appropriate units, instruments, and methods. (*Performance and conversion of measurements*)

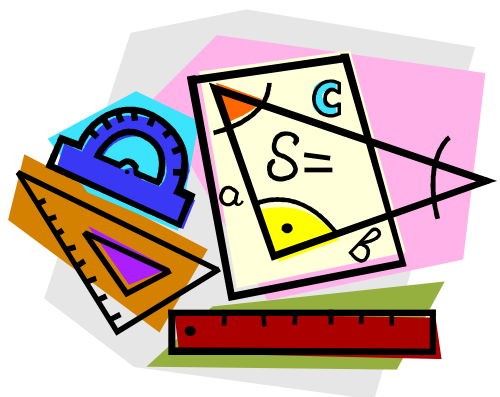
1. Select units and scales that are appropriate for problem situations involving measurement. **
2. Convert between the U.S. customary and metric systems given the conversion factor.

► **Standard 7B** - Students who meet the standard can estimate measurements and determine acceptable levels of accuracy. (*Estimation*)

1. Estimate the magnitude and directions of physical quantities (e.g., velocity, force, slope).
2. Determine answers to an appropriate degree of accuracy using significant digits.

► **Standard 7C** - Students who meet the standard can select and use appropriate technology, instruments, and formulas to solve problems, interpret results, and communicate findings. (*Progression from selection of appropriate tools and methods to application of measurements to solve problems*)

1. Solve problems using indirect measurement by choosing appropriate technology, instruments, and/or formulas.
2. Check measurement computations using unit analysis. **
3. Describe the general trends of how the change in one measure affects other measures in the same figure (e.g., length, area, volume).
4. Determine linear measures, perimeters, areas, surface areas, and volumes of similar figures using the ratio of similitude.
5. Determine the ratio of similar figure perimeters, areas, and volumes using the ratio of similitude.
6. Calculate by an appropriate method the length, width, height, perimeter, area, volume, surface area, angle measures, or sums of angle measures of common geometric figures, or combinations of common geometric figures.
7. Solve problems involving multiple rates, measures, and conversions.



STATE GOAL 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

Why This Goal Is Important: Geometry provides important methods for reasoning and solving problems with points, lines, planes and space. The word “geometry” comes from Greek words meaning “measurement of the Earth.” While we use modern technology and employ a wider variety of mathematical tools today, we still study geometry to understand the shapes and dimensions of our world. The applications of geometry are widespread in construction, engineering, architecture, mapmaking and art. Historically, geometry is a way to develop skill in forming convincing arguments and proofs. This goal of developing a means of argument and

validation remains an important part of our reasons for studying geometry today.

► **Standard 9A** - Students who meet the standard can demonstrate and apply geometric concepts involving points, lines, planes, and space. (*Properties of single figures, coordinate geometry and constructions*)

1. Describe and apply properties of a polygon or a circle in a problem-solving situation.
2. Classify angle relationships for two or more parallel lines crossed by a transversal.
3. Analyze geometric situations using Cartesian coordinates. **
4. Represent transformations of an object in the plane using sketches, coordinates, and vectors.
5. Design a net that will create a given figure when folded.
6. Solve problems using constructions.
7. Gain insights into, and answer questions in, other areas of mathematics using geometric models. **

8. Calculate distance, midpoint coordinates, and slope using coordinate geometry.
9. Visualize a three-dimensional object from different perspectives and describe their cross sections. **
10. Identify and apply properties of medians, altitudes, angle bisectors, perpendicular bisectors, and midlines of a triangle.

► **Standard 9B** - Students who meet the standard can identify, describe, classify and compare relationships using points, lines, planes, and solids. (*Connections between and among multiple geometric figures*)

1. Solve problems using triangle congruence and similarity of figures.
2. Extend knowledge of plane figure relationships to relationships within and between geometric solids.
3. Identify relationships among circles, arcs, chords, tangents, and secants.
4. Solve problems in, and gain insights into, other disciplines and other areas of interest such as art and architecture using geometric ideas. **
5. Analyze and describe the transformations that lead to successful tessellations of one or more figures.

► **Standard 9C** - Students who meet the standard can construct convincing arguments and proofs to solve problems. (*Justifications of conjectures and conclusions*)

1. Create and critique arguments concerning geometric ideas and relationships such as properties of circles, triangles and quadrilaterals.
2. Develop a formal proof for a given geometric situation on the plane.
3. Provide a counter-example to disprove a conjecture.
4. Develop conjectures about geometric situations with and without technology.
5. Justify constructions using geometric properties.
6. Describe the difference between an inductive argument and a deductive argument.

► **Standard 9D** - Students who meet the standard can use trigonometric ratios and circular functions to solve problems.

1. Determine distances and angle measures using indirect measurement and properties of right triangles.
2. Solve problems using 45° - 45° - 90° and 30° - 60° - 90° triangles.

* *National Council of Teachers of Mathematics. Principles and Standards for School Mathematics. Reston, Va: National Council of Teachers of Mathematics, 2000.*

** *Adapted from: National Council of Teachers of Mathematics. Principles and Standards for School Mathematics. Reston, Va: National Council of Teachers of Mathematics, 2000.*